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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,882	02/11/2004	Valeri V. Golovlev	59004.US	3388

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EXAMINER	
DO, PENSEE T	

ART UNIT	PAPER NUMBER
1641	

DATE MAILED: 05/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/776,882	GOLOVLEV ET AL.	
	Examiner	Art Unit	
	Pensee T. Do	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 18-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10, 18-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Amendment Entry & Claims Status

The amendment filed on March 2, 2006 has been acknowledged and entered.

Claims 1-10, 18-21 are pending.

Withdrawn Rejection(s)

Rejections under 112, 2nd paragraph in the previous office action are withdrawn.

Rejection under 102(e) for claims 13-16 (which are now cancelled) is withdrawn herein.

Rejection under 103 is withdrawn herein for claims 11, 12 and 17 which are now cancelled.

Maintained Rejection(s)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-6,18, 19, 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Remacle et al. (US Patent Application Publication 2003/0096321 A1) in view of Fritzsche et al. (Biomedical Nanotechnology Architecture and Applications, Vol. 4626, 2002).

Remacle teaches a method for the identification and/or quantification of a target compound obtained from a biological sample, comprising the steps of putting into

contact the target compound with a capture molecule in order to allow a specific binding between said target compound and the capture molecule, said capture molecule being fixed upon a surface of a solid support according to an array comprising a density of at least 20 discrete regions per squared centimeter, each of said discrete region is fixed with a capture molecule, performing a reaction leading to a metallic precipitate (metal deposit) formed at the location of said binding, determining possible presence of the precipitate in discrete regions by the detection and recording means such as a scanner, and correlating the presence of the metallic precipitates at the discrete regions (precipitate pattern) with the identification and/or quantification of said target compound. [0019]. The solid support is made of glass, electronic device, polymeric or metallic materials, etc, including materials such as plastic supports, which present an intrinsic fluorescence. [0037]. The formation of a metallic precipitate at the location of binding is obtained with the fixation of a metallic compound upon the target compound or by the result of a metal precipitation in the presence of an enzyme. Advantageously, a reduction of silver in the presence of colloidal gold allows the formation of a precipitate. [0041], [0051]. The gold particles and the silver compound are in solution because Remacle teaches that the method is particularly well adapted for high throughput screening on microarrays using multiwell plates containing the solutions for performing the various steps of the process [0103- lines 18-21] The target and the capture molecules are DNA which can hybridize, [0052], [0055], or proteins [0049]. The gold colloidal particles have size from 1 um to 20 um in diameter. [0062]. Remacle also teaches a method for imaging a sample (said solid support surface comprising said

metallic precipitation) comprising projecting a transmission mode light from a light source onto said sample during a transmission mode time period, detecting light on detector from the light source and projecting diffuse scattering light from the same light source onto said sample during similar or other than said reflection mode time period and detecting reemitted light on said detector from said sample. [0068]. The device for imaging a sample comprises a carrier element for supporting a sample. For claims 18 and 19, Remacle teaches that said sample substrate is preferably a transparent polymeric or glass slide and said support is configured for allowing the introduction of the sample into the opening bay of the device. [0086]. For claim 19, the substrate can be made from plastic [0045], which is inherently opaque. For claim 21, Remacle teaches a light absorbing screen which is located at a predetermined distance behind the substrate (see fig. 2A-2B, character 4 and 5 which are the black and white backgrounds). Gold particles are generally negatively charged. Thus, it is inherent that the gold colloidal particles used in Remacle are negatively charged. For the new limitation that requires the target molecular moieties obtained from a sample consisting essentially of target molecular moieties which have not been chemically modified from their native state in the biological sample, such limitation is taught in example 4.

However, Remacle fails to teach measuring the density of the precipitated colloidal particles on the surface of the substrate.

Fritzsche teaches a method of nanoparticle-labeling technique from microscopical applications for DNA-chip detection. The method comprises binding a probe DNA to a solid support/ glass substrate in multiple sites, adding gold

nanoparticle-labeled target DNA to the solid support/glass substrate; precipitating silver solution on the solid support; scanning the solid support and measuring the density of the nanoparticles based on the signal obtained. Strong signal means high density, and weak signal means low density. (see pages 18,19, 20-Results and discussion;).

It would have been obvious to one of ordinary skills in the art to measure the density of the nanoparticles at various locations on the solid support as taught by Fritzsche using the method of Remacle because both references teach imaging microarray using a scanner such as CCD. According to the method of measuring the density taught by Fritzsche, if the signal at a particular discrete site is strong, then the density of nanoparticle at such spot would be high and could be visualized by the naked eye and vice versa. Thus, one of ordinary skills in the art would be able to identify the location of the target on the solid support quickly without using any special device.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Remacle in view of Fritzsche as applied to claim 1 above, and further in view of WO 95/22639.

WO 95/22639 teaches a process for producing coated, especially metal-coated, polymer particles, in which polymer microparticles with an electrically and preferably positively charged surface are synthesized and are then caused to react with oppositely charged, preferably metal-sol particles. (see abstract).

It would have been obvious to one of ordinary skills in the art to coat the negatively charged gold-metal particles with a positively charged polymer as taught by WO95/22639 and used such particles in the combined method of Remacle and

Fritzsche because polymer coating provides functional groups which can bind to the solid support or the target biological substance.

Claims 8, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Remacle in view of Fritzsche as applied to claim 1 above, and further in view of Rubner et al. (US 5,536,573).

Remacle and Fritzsche have been discussed above.

However, Remacle and Fritzsche fail to teach treating the surface of the solid support with a solution of positively or negatively charged polymer substances.

Rubner teaches a method of treating the surface of a hydrophilic or hydrophobic glass slide by first immersing the substrate/solid support in the polycation solution and then in the polyanion solution to produce a negatively charged solid support. For a positively charged glass slide, the substrates were first immersed in the polyanion solution and then in the polycation solution. (see col. 11, lines 10-20).

It would have been obvious to one of ordinary skills in the art to use the method of surface treatment of the solid support/glass slide to produce positively or negatively charged glass slides as taught by Rubner to treat the solid support used in the method of Remacle and Fritzsche so that DNA molecules or proteins which contain an electrical charged can be absorbed on the solid support through electrostatic interaction.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Remacle in view of Fritzsche as applied to claim 1 above, and further in view of Roninson (US 4,675,283).

Remacle and Fritzsche fail to teach providing a latent pattern of molecular structures on the solid support by enzymatic digestion of molecular structures on the surface of the solid support.

Roninson teaches enzyme digestion to digest unhybridized single-stranded DNA and followed by detection. (see abstract).

Since DNA digestion is well known in the art to eliminate unhybridized single stranded DNA, it would have been obvious to one of ordinary skills in the art to use enzyme digestion to get eliminate unhybridized single stranded DNA as taught by Roninson to eliminate the unhybridized DNA in the method of Remacle and Fritzsche since Remacle and Fritzsche teach hybridizing DNA or nucleic acid on a solid substrate.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Remacle in view of Fritzsche as applied to claim 1 above, and further in view of Caskey (US 6,286,965).

Remacle and Fritzsche have been discussed above.

However, Remacle and Fritzsche fail to teach that the glass transparent substrate is blackened on one side by light absorbing paint.

It is well known in the art, as taught by Caskey, that light absorbing black paint is usually coated onto glass on one side to absorb most of the light transmitted through the mirror. (see col. 11, lines 46-60).

It would have been obvious to one of ordinary skills in the art to apply the same concept of painting one side of a glass substrate black as taught by Caskey in the method of Remacle and Fritzsche for good quantification of the signal. Light, if not

absorbed would reflect from the glass substrate. Thus, by using such a technique for absorbing light as taught by Caskey, all the light would be absorbed on the glass substrate and such absorption allows good quantification of the signal. (see Remacle col. 13, [0172]).

Response to Arguments

Applicant's arguments filed March 2, 2006 have been fully considered but they are not persuasive.

Applicants have now amended the claims to recite "providing a solution of target molecular moieties ...consisting essentially of target molecular moieties which have not been chemically modified from their native state in the biological sample" and argue that the cited references fails to teach the above new limitation. Applicants specifically point out that Remacle at [0052] teaches the target molecule is labeled.

Remacle, in example 4, teaches a sandwich assay for detection of IgE on microarrays. Such method comprises providing: the IgE antibodies were spotted on the slides (solid support) which is equivalent to the step "providing a solid support.." of the present invention; the slides immobilized with IgE antibodies is incubated with target IgE to form a complex. The target IgE has not been chemically modified from their native state. Another step of adding an anti-IgG antibodies to the complex above to form a sandwich of slide-anti-IgE antibodies-Target-anti-IgG antibodies. The label, which binds to the anti-IgG antibodies is then added. (see example 4). Remacle also teaches in [0055] that an alternative to avoid labeling of the target molecule is to use a second nucleotide sequence which is labeled. They then form a sandwich hybridization or a

sandwich reaction with the capture molecule fixing the target and the labeled nucleotide sequence, which allows the detection to go on. Thus, Remacle meets the requirement of the new limitation to provide a sample comprising targets which have not been chemically modified. However, the claims of the present invention fail to exclude extra step such as adding a molecule such as a sandwich second antibody such as the anti-IgG antibody in example 4 or a second nucleotide molecule in [0055] because the method recites a transition "comprising" language.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pensee T. Do whose telephone number is 571-272-0819. The examiner can normally be reached on Monday-Friday, 7:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Pensee T. Do
Patent Examiner
May 10, 2006

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05/12/06